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POPULATION GROWTH, LABOUR ABSORPTION  
AND INCOME DISTRIBUTION

By

Dharam P. Ghai

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Dharam P. Ghai

INSTITUTE FOR DEVELOPMENT STUDIES

UNIVERSITY OF NAIROBI

P.O. Box 30197  
Nairobi, Kenya

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Dharam P. Dhari

ABSTRACT

The purpose of this paper is to explore the main qualitative relationships between population growth, employment expansion and changes in income distribution. These relationships are extremely complex with an intricate pattern of links and feedbacks not only among these variables, but between them and a host of other economic, sociological, political and institutional variables. The first part of the paper reviews the findings of the quantitative economic-demographic models with respect to the impact of differential rates of population increase on the rate and structure of economic growth. Most of these models ignore the employment and income distribution effects of differential rates of population growth. An attempt is then made to specify the ways in which variations in population growth affect the supply and demand for labour and hence net labour absorption. The usual conclusion that a faster rate of population growth exacerbates the employment problem on the supply side is qualified by considerations of participation rates and quality of labour force under different rates of population increase. On the demand side, the impact of variations in population growth is assessed on capital accumulation, composition of output, pattern of growth and changes in productivity induced by such factors as technical change, nutrition, education and training. The impact on income distribution is evaluated by assessing the effects of differential rates of population growth on the main determinants of income distribution by size. Among the factors considered are: ratio of labour to reproducible capital, distribution of assets, change in the structure of the economy, technical change and the skill composition of labour force. A theme running through the paper is that reduced fertility can create the potential for greater net labour absorption and more favourable income distribution. But this potential can only be realized by the pursuit of an appropriate strategy of development to further these objectives. In its absence, it is not at all clear that reduced fertility will make a decisive difference to income distribution and labour absorption.

POPULATION GROWTH, LABOUR ABSORPTION AND INCOME DISTRIBUTION

Despite the great concern with the problems of unemployment and income distribution in developing countries that has arisen in recent years, the literature on population has tended to assign them a minor place. The great majority of the work on the subject has dealt with the impact of differential rates of population growth on such variables as economic expansion, increase in per capita income, rural-urban migration and urbanisation, and on attainment of goals in education, health, housing and similar welfare services. While employment expansion and income distribution are obviously affected by these variables, they have seldom been explored in a systematic manner.<sup>1</sup> Rather the central concern of the qualitative work as well as of the quantitative demographic-economic models has been with the overall measures of economic growth and structure. As in other writings on development, it has often been assumed implicitly that the favourable effects of slower population growth on economic growth demonstrated by these models have a corresponding favourable impact on employment and income distribution. Yet we know from a growing number of studies that high rates of economic expansion sustained over one or two decades may fail to make a significant dent into the problems of unemployment and poverty and may indeed intensify them.<sup>2</sup>

The purpose of this paper is to explore the main relationships between population growth, employment expansion and changes in distribution of income. These relationships are extremely complex with an intricate pattern of links and feedbacks not only among these variables, but between them and a host of other economic, sociological, political and institutional variables. In a short paper such as this, it is obviously not possible to do justice to these complexities. Rather this paper has attempted to isolate the main factors which bear on these issues. It is essentially of a speculative and conjectural nature, drawing heavily on the pioneering work of other writers on the subject.

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1. A notable exception is the work that has recently been started under the World Employment Programme of the ILO in which a major cluster of research projects is concerned specifically with the employment implications of population growth. See; Scope, Approach and Content of Research Oriented Activities of the World Employment Programme, ILO, Geneva, 1972.

2. See especially, David Turnham, The Employment Problem in Less Developed Countries, OECD Development Centre, Paris, 1971.

We begin with a brief summary of the growing consensus on the impact of differential rates of population growth on economic expansion in developing countries. The purpose of this section is to highlight the economic consequences of alternative rates of population growth as spelled out in a number of economic-demographic models. With this background, we move on to a consideration of the specific employment and income distribution effects of differential rates of population growth. At this stage, we shall broaden the discussion by critically examining the realism and limitations of the assumptions made in the conventional economic-demographic models and by taking explicit account of some relevant factors left out of these models.

### POPULATION GROWTH AND ECONOMIC EXPANSION

The impact of population on economic development is isolated by an analysis of the process of economic growth of a country under alternative rates of population growth. It is generally assumed that while mortality trends follow more or less the same path, the difference in rates of population growth results from differences in the decline in fertility rates. The different rates of population growth then affect the aggregate output, per capita output and structure of the economy through their effect upon the basic inputs of land, labour and capital. While different models differ in their methodology, the level of disaggregation and the number of parameters used, they yield basically similar results with respect to projections of output and economic structure.<sup>3</sup>

The main results of projections made by these models may be summarised as follows:

- i) The level of aggregate output over a given period as well as during the period, usually taken as 30 years from the time the decline in fertility begins, will tend to be higher under the declining relative to the constant fertility case;
- ii) The per capita advantage of declining fertility will be greater and will increase cumulatively over time; and
- iii) The economy will have a more "modern" structure under declining fertility, as reflected in the relatively greater share of manufacturing, transportation, communications and relatively smaller share of agriculture in total output.

3. For a convenient summary of the main characteristics and results of these models, see Theodore K. Ruprecht and Carl Wahren, Population Programmes and Economic and Social Development, OECD Development Centre, Paris, 1970, ch.II.

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The interest of these projections lies not only in the qualitative, but perhaps even more in the quantitative differences under alternative assumptions of rates of population growth. Here clearly the values assumed for various parameters such as marginal savings, capital-output ratios, etc. become crucial. But a rough idea of the magnitudes involved may be obtained from one of the most thorough and careful attempts to make such projections.<sup>4</sup> According to Coale and Hoover, on the basis of various "reasonable" assumptions about Indian demographic and economic parameters,<sup>5</sup> the following results are obtained with respect to income and consumption per equivalent adult consumer:

Table 1. Impact of Differential Population Growth Rate on Income and Consumption Per Equivalent Adult Consumer.

|                                     | <u>1956</u> | <u>1971</u> | <u>1986</u> |
|-------------------------------------|-------------|-------------|-------------|
| 1. <u>Income Per Consumer</u>       |             |             |             |
| Constant Fertility                  | 100         | 120         | 138         |
| Declining Fertility                 | 100         | 128         | 195         |
| 11. <u>Consumption Per Consumer</u> |             |             |             |
| Constant Fertility                  | 100         | 116         | 132         |
| Declining Fertility                 | 100         | 124         | 180         |

Source: Coale and Hoover, op. cit., Table 37, p.272.

Results derived from other models also indicate that "the advantage of fertility reduction amounts to a per capital income advantage of approximately 3-5 per cent after 10 years, 15-25 per cent after 20 years, and 25-50 per cent after 30 years".<sup>6</sup>

4. Ansley J. Coale and Edgar M. Hoover, Population and Economic Development in Low-Income Countries, Princeton, Princeton University Press, 1958.

5. The demographic assumptions are constant fertility between 1956 and 1986 in one case and reduction of fertility rates by half over the period in the other; identical decline in mortality trends is assumed in both cases. The main economic assumptions are that the amount of funds available for private investment and public outlays depends both upon national income and the level of average income per equivalent adult consumer. The growth promoting impact of these funds is derived from a weighted average of the different capital/output ratios of the uses to which these funds are put, namely, directly productive investment, welfare outlays immediately affecting productivity, and other welfare outlays with delayed productivity effects. A number of results are obtained on the basis of different values for these relationships.

The fundamental reason for results of this sort is that over a period of say 20 to 30 years, high fertility leads to a much larger size of population than declining fertility, while the number in the productive age groups shows only a small difference. Thus a larger fraction of any given national output has to be allocated to current consumption. Furthermore, a larger proportion of the resources available for development have to be allocated for education, health, housing and other social overheads in the high fertility case since the proportion of children is much higher than under conditions of declining fertility. The lower consumption per worker may also lead to lower productivity due to poor health, malnutrition, etc.

It may be argued that the disadvantages of higher fertility may be more than compensated in the long run when higher birth rates begin to make an impact on the size of the labour force. It can, however, be shown within the framework of the demographic-economic models referred to earlier, that the advantages of higher initial per capital income, the lower burden of dependency and proportionately larger development outlays under reduced fertility will continue to widen the gap in per capita incomes and per capita consumption, though the aggregate output may be greater under high fertility on the basis of favourable assumptions about the employment prospects and productivity of the additional labour force.<sup>7</sup>

There are also offsetting factors at work in the other direction: the pressure of increasing population, the persistent demands for more and better education, health and services may spur additional effort on the part of individuals and governments and may lead to harder work and higher savings and development outlays. But it is also possible that in some countries with centuries of poverty and miserable living standards, pressure of population may merely intensify the existing apathy and fatalism. The fundamental factors in economic development, although impossible to quantify, are the way the government organises the economy, whether the people are motivated by material or other incentives to work and save, whether the fruits of growth are equitably distributed and whether the energies of people are purposefully mobilised and engaged in the tasks of

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7. Coale and Hoover, op. cit., Ch. XXII.

development. But there is no reason to believe that differential rates of population growth per se have any independent influence on these fundamental prerequisites of economic development.

#### POPULATION AND EMPLOYMENT

With this background of the general impact on economic growth of differential rates of population growth, we can turn to the more specific effects on employment.<sup>8</sup> We shall first examine the impact of differential rates of population growth on the supply of labour and then turn to their effect on employment expansion.

#### Population Growth and Labour Supply

The task of relating population growth to labour supply is relatively simple, at any rate if one makes a number of simplifying assumptions which, however, do not unduly distort realities. Differences in growth rates of population may derive from differing trends in mortality or fertility and these will have different effects on the size and age distribution of population. However, it is generally assumed that for a number of reasons differences in mortality rates as a primary explanation of different rates of population growth are less important and significant.<sup>9</sup> Therefore most analyses of population and economic growth explore the impact of differential rates of population growth caused by differing trends in fertility rates. The resultant differences in the size of the labour force can be easily contrasted by assuming unchanged high fertility in one case and, say, a linear reduction in half over a thirty year period in the other case. On the basis of these assumptions and starting with the demographic profile of India in 1956, Coale and Hoover projected the following differences in the size of labour force age groups over different periods in the two cases.

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8. It should be stressed that throughout this paper employment is defined to include all productive work; it is, therefore, not to be confused with wage employment.

9. For a detailed discussion of this, see Nathan Keyfitz, "Changes of Birth and Death Rates and Their Demographic Effects," in Rapid Population Growth: Consequences and Policy Implications, Vol II, Baltimore, John Hopkins Press, 1971.



Table 2. Labour Force Age Group (15-65) under Different Fertility Assumptions.

|                   | 1956 | 1971 | 1986 | 2001 | 2011 |
|-------------------|------|------|------|------|------|
| High Fertility    | 100  | 109  | 187  | 274  | 359  |
| Reduced Fertility | 100  | 109  | 173  | 198  | 209  |

Source: Computed from Coale and Hoover, op. cit., Tables 30 and 45.

The main conclusion that emerges from the above table is that while differential fertility rates make very little relative difference to the labour force age groups during the first fifteen to thirty years after the onset of decline in fertility, these differences widen progressively over time from no difference in the first 15 years, rising to 8 per cent after 30 years and to 72 per cent after 55 years. The implications for employment are obvious: while in the short to medium run, the rate of population growth has virtually no effect on the number of persons for whom employment opportunities must be provided, the relative increase in their numbers rises progressively over time after 15 years with higher rates of population growth. To the extent that a country is faced with the problem of long run inadequate employment opportunities, higher rates of population growth intensify them on the supply side.

Two qualifications should be made to the analysis. In the first place, the labour force available for productive work outside the household is not synonymous with what we have deliberately called the labour force age group. Ignoring the great conceptual and practical problems involved,<sup>10</sup> it can at least be said that participation rates will be affected differently by different rates of population growth. On the one hand, higher per capita income and other socio-economic factors that go with it will tend to raise participation rates under lower fertility, especially among females. This effect is likely to be reinforced by the fewer pregnancies and smaller family size under lower fertility. On the other hand, higher per capita income will presumably facilitate higher education for a larger proportion of the relevant

10. Some of them are mentioned in Richard Jolly, *Employment Problems in Less Developed Countries* (Paper presented to the International Meeting of Directors of Development Research and Training Institutes, OECD, 1972). Others are that in most developing countries children may make significant contribution to household income, attitude towards female participation varies greatly with social and cultural traditions, etc. See Turnham, op. cit.; Ch.II.

age group, thus lowering participation rates. These factors will be at work both in the medium and in the long run. The net effect is likely to be to raise the participation rates within the labour force age group under the lower fertility case, thus increasing the supply of labour.

The second and more important qualification relates to the quality of the labour force. Higher per capita income under the reduced fertility case permits higher levels of per capital consumption and other welfare services which are generally believed to make a significant contribution in the poor countries to the efficiency and productivity of the existing labour force.<sup>11</sup> This effect is likely to be even more marked among the new entrants to the labour force, for apart from improved nutrition and health, the lower fertility situation permits a more favourable family environment and larger expenditure per head on education and training of persons in the 0-15 age group.<sup>12</sup>

This has two implications for the employment situation. In the first place, in every country there are structural imbalances between the kind of labour demanded and supplied. The typical sort of imbalances in

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11. Gunnar Myrdal, The Challenge of World Poverty, Harmondsworth, Penguin Books, 1970, lays heavy stress on the positive efficiency and productivity effects of improved nutrition, health, etc.

12. There is steadily growing evidence of the harmful effects on both children and parents of the large family size and short birth intervals associated with rapid population growth. While the effects of malnutrition in early years on mental development have been generally recognized, recent evidence, admittedly somewhat meagre, indicates that larger family size and shorter birth intervals make children prone to increased illness, increased mortality rates, less satisfactory growth and intellectual development, smaller physical size, and also cause increased illness in the parents, as well as clear-cut economic and emotional stresses. Research on this subject has been based for the most part in developed countries, but there is no reason to suppose that similar if not more serious results may not occur in developing countries. If these effects are significant, they clearly have profound implications for the social and economic welfare that goes with different rates of fertility. For a review of some evidence on these issues, see Harvey Leibenstein, "The Impact of Population Growth on Economic Welfare - Nontraditional Elements," and Joe D. Wray, "Population Pressure on Families: Family Size and Child Spacing," in Rapid Population Growth: Consequences and Policy Implications, op. cit.

developing countries manifest themselves on the one hand in specific skill shortages, and on the other in the mismatching of employment opportunities and expectations of educated youth.<sup>13</sup> Secondly, to the extent that more and better training and education are an independent source of increase in productivity, the labour absorption capacity of a given increase in gross domestic product is correspondingly reduced.<sup>14</sup> Whether in a given country these two factors will operate to alleviate or intensify the unemployment problems will depend on a host of other policies such as the kind of education and training provided, the functioning of the labour market, including the structure and level of factor prices, technology and so on. These issues will be taken up in the next section, but we hazard a judgement that in the past these potentially favourable effects of lower fertility have probably intensified the unemployment problems in a majority of developing countries in the short to medium run.

#### Population Growth and Employment Expansion

We now turn to the question of how the provision of employment opportunities in the broadest sense will be affected by differential rates of population growth. The few studies that have addressed themselves to this question come to sharply different conclusions.<sup>15</sup> This is hardly surprising since the results obtained from any quantitative model are determined by the specifications assumed with respect to such relationships as labour demand and capital accumulation, nature of technical progress, structural changes

13. See in particular the ILO Report, Matching Employment Opportunities and Expectations: A Programme of Action for Ceylon, Geneva, 1971.

14. This is not to deny that a more trained and educated labour force will have other favourable effects on economic development, such as for example through greater labour mobility, receptivity to innovations and entrepreneurship and risk-taking.

15. S. Enke, in "Economic Consequences of Rapid Population Growth," Economic Journal, December, 1971, concludes that over thirty years unemployment will be lower with low population than with high population growth. Richard Blandy, in "Population and Employment Growth: An Empirical Exploration," International Labour Review, October, 1972, concludes that "a reduction in population growth brings an acceleration in the transformation of the economy at the apparent cost of accentuating unemployment and underemployment problems in the early stages of transformation," p. 361.

in the economy, differential rates of growth of sectoral outputs, productivity, etc. The purpose of this section is to isolate the main factors which determine the growth of employment opportunities under alternative rates of population growth. Broadly speaking, three kinds of inter-related economic changes associated with different rates of population growth are relevant when appraising the growth of employment opportunities: i) rate of economic expansion; ii) structure of output; and iii) pattern of growth. Most of the existing studies on the subject have concentrated on the first two, whereas the third factor may well turn out to be the decisive element in determining employment growth.

In its simplest form, it is stated that lower fertility has a favourable effect on labour absorption because it facilitates a larger proportion of national income to be saved and an even larger proportion to be devoted to productive development outlays. Since in the medium run the size of the population in the working age group is not affected by fertility differentials, a higher rate of capital accumulation, other things being equal, will absorb larger numbers of persons in productive employment. In evaluating this argument, some attention should be paid to the impact of more rapid capital accumulation on technological and productivity changes.

The findings of the economic-demographic models suggest that the advantage of fertility reduction in terms of per capita income amounts to approximately 3-5 per cent after 20 years. The relatively small income per capita advantage under reduced fertility shows how its apparent advantage in labour absorption can be easily wiped out by somewhat less than 0.3-.5 per cent annual differences in productivity increases over the first ten years. We have already referred to arguments in the earlier section indicating that because lower fertility permits an absolutely larger amount of consumption per head, this could have positive effects on labour efficiency and productivity through improved nutrition, etc.<sup>16</sup> Secondly, faster capital accumulation under conditions prevailing in most developing countries tends to be associated with greater capital intensity in the productive process

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16. On the other hand, not all models incorporate this assumption in their estimation of income growth under alternative trends in fertility.

(most obviously through the use of the latest technology imported from developed countries), and this will tend to raise productivity per worker in the reduced fertility case. In the longer run, the per capita income advantages are somewhat greater under reduced fertility, but these may again be offset by the presumably greater productivity effect of better family environment, training and education of the new entrants to the labour force.

The final outcome will clearly depend on the quantitative effect of the opposing forces at work. The burden of the arguments presented above is that even disregarding the structural changes associated with relative differentials in per capita income growth, the alleged favourable effect on labour absorption under reduced fertility may be more than wiped out by larger increases in productivity, both in the medium and in the long run, caused by a better fed, trained and educated labour force and by greater capital intensity in the productive process.

The relationship between population, per capita income and the structure of the economy has been explored in a number of studies.<sup>17</sup> The studies show that higher per capita income is associated with a relatively smaller share of agriculture and relatively larger shares of industry and transportation and communications in the total output. Obviously for any given country the extent to which international trade is engaged in will also be an important influence. Ruprecht and Wahren have investigated the impact of population growth on market structure and their model yields the results shown in Table 3.

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17. Most notably in Hollis Chenery, "Patterns of Industrial Growth," American Economic Review, September, 1960.

Table 3. Population Growth and Economic Structure.

| Rate of<br>Growth of<br>Total<br>Output<br>in<br>per cent<br>per year | Number<br>of years<br>after<br>date of<br>possible<br>fertility<br>decline | Per cent of Total Value Added Produced<br>in Given Sector |      |          |      |                                |     |        |     |                |      |
|---|--|---|------|----------|------|--------------------------------|-----|--------|-----|----------------|------|
|   |  | Agriculture   |      | Industry |      | Transportation & Communication |     | Mining |     | Other Services |      |
|   |  |   |      |          |      |                                |     |        |     |                |      |
|   |  |   |      |          |      |                                |     |        |     |                |      |
|   |  |   |      |          |      |                                |     |        |     |                |      |
| I   | II   | I   | II   | I        | II   | I                              | II  | I      | II  |                |      |
| 3.5   | 0  | 31.5  | 31.5 | 22.8     | 22.8 | 4.9                            | 4.9 | 1.6    | 1.6 | 39.2           | 39.2 |
|   | 10   | 30.7  | 30.2 | 23.2     | 23.5 | 5.0                            | 5.0 | 1.7    | 1.7 | 39.4           | 39.5 |
|   | 20   | 30.1  | 28.3 | 23.5     | 24.7 | 5.0                            | 5.2 | 1.8    | 1.7 | 39.6           | 40.0 |
|   | 30   | 29.6  | 25.8 | 23.6     | 26.3 | 5.1                            | 5.5 | 1.9    | 1.8 | 39.8           | 40.6 |
| 6.0   | 0  | 29.7  | 29.7 | 23.9     | 23.9 | 5.1                            | 5.1 | 1.6    | 1.6 | 39.6           | 39.6 |
|   | 10   | 25.7  | 25.2 | 26.5     | 26.8 | 5.5                            | 5.6 | 1.7    | 1.7 | 40.6           | 40.7 |
|   | 20   | 22.0  | 20.6 | 29.1     | 30.3 | 6.0                            | 6.1 | 1.7    | 1.7 | 41.3           | 41.3 |
|   | 30   | 18.8  | 16.2 | 31.5     | 34.1 | 6.4                            | 6.7 | 1.8    | 1.6 | 41.5           | 41.4 |

Source: Ruprecht and Wahren, *op. cit.*, p. 32.

The table shows that the rate of structural change is strongly influenced by the trends in fertility and by the rate of growth of total output. The employment implications of differing rates in fertility will depend on the relative size and labour intensity of agriculture and other sectors, intra-sectoral changes in productivity over time and the availability of land. In countries with a large proportion of the labour force in agriculture, large and increasing differentials in productivity between agriculture and the "modern" sectors and relative abundance for land, the advantages in labour absorption lie heavily in favour of rapid population growth. Where these conditions are reversed, the reduced

fertility case will yield more favourable effect on labour absorption.

Some of the factors relevant in appraising the impact of patterns of growth on labour absorption have already been touched upon in the preceding discussion. By pattern of growth, we refer specifically to the manner in which factors of production are combined and the size of productive units. Basically, this is the distinction between a broad-based development and growth accruing primarily through rapid expansion of certain products or sectors based on a large scale, capital intensive mode of production. Given a certain rate of economic expansion and composition of output, contrast a situation where growth is brought about by rapid development of manufacturing or mining sectors using highly capital intensive techniques and large scale commercialisation of agriculture, with the situation where a similar growth is produced by increases in output of a multitude of small and medium scale enterprises in agriculture, manufacturing and other sectors of the economy.<sup>18</sup> It is clear that the labour absorption potential of the latter pattern of growth will be vastly greater than that of the former. What is not clear is the way differential rates of population growth affect the pattern of growth. This relationship has not been explored in any study known to the author. Perhaps no such relationship can be established on the basis of empirical studies of the development experience of different countries. But the presumption remains that the broad-based pattern of development is more likely to be associated with a more rapid growth of population.

#### POPULATION GROWTH AND UNEMPLOYMENT AND UNDEREMPLOYMENT

We can now bring together the supply and demand sides of the equation to assess the differential rates of population growth on unemployment and underemployment. The above discussion of the positive and negative effects on net labour absorption can be conveniently summarised in Table 4.

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18. It is of course not realistic to assume that the composition of output will be unaffected by what we have called the "pattern of growth".



Table 4. Impact on Growth of Unemployment of Differential Population Growth Rates.

| A. <u>Supply of Labour</u>   | <u>High Fertility</u> | <u>Reduced Fertility</u> |
|--|-----------------------|--------------------------|
| I. <u>First 15 years</u>   |                       |                          |
| i) Numbers in Working Age Group                                    | 0                     | 0                        |
| ii) Participation  | +                     | -                        |
| II. <u>After 15 years</u>  |                       |                          |
| iii) Numbers in Working Age Group                                  | -                     | +                        |
| iv) Participation  | +                     | -                        |
| B. <u>Labour Absorption</u>  |                       |                          |
| v) Capital Accumulation  | -                     | +                        |
| vi) Productivity Changes   | + }                   | -                        |
| a) Technical change  |                       |                          |
| b) Impact of nutrition on existing labour force                    |                       |                          |
| c) Impact of nutrition, education and training on new labour force |                       |                          |
| vii) Composition of Output   | + <sup>i</sup>        | - <sup>i</sup>           |
| viii) Pattern of Growth  | ?                     | ?                        |

Notes: (-) sign indicates an increase in effective labour supply or a relative decrease in labour absorption, (+) sign indicates the opposite.

<sup>i</sup>Likely, depending upon conditions specified in the text.

The overall effect of differential rates of population increase on the growth of unemployment and underemployment will naturally depend on the quantitative value of the positive and the negative effects on net labour absorption. This has not been attempted in this paper. While economic-demographic models attempt to quantify these effects, for the most part they fail to incorporate such crucial relationships as the effect of differential rates of population growth on participation rates of working age population, the impact on productivity of improved nutrition, education and training, the structural imbalances in the labour supplied and demanded, the impact of rapid capital accumulation on technical change, inter-sectoral



differences in productivity growth and the pattern of growth. Although the incorporation of such relationships in models presents extremely difficult conceptual and empirical problems and would add greatly to their complexity, their neglect must necessarily lead to partial, misleading and often contradictory results.

We may hazard our judgement that lower fertility makes it potentially easier to solve the unemployment and underemployment problems. Even the apparently negative effects on net labour absorption of reduced fertility such as higher participation rates and improvement in productivity brought about by various factors listed above could be turned to advantage if appropriate policies are followed in such diverse fields as the level and structure of factor prices, the functioning of the labour market, the adoption of appropriate technology, educational and training systems and pursuit of a broad-based development effort. Experience thus far does not indicate that the performance in this respect varies in any systematic manner with per capita differences among developing countries, or that potentially favourable effects of lower fertility could be turned to the advantage of maximum net labour absorption. But our understanding of the complex factors determining labour absorption has been greatly increased in recent years, and thus past experience cannot necessarily be taken as a valid guide to future performance.

#### POPULATION GROWTH AND INCOME DISTRIBUTION

The relationship between population growth and changes in income distribution has received very little attention in the literature. We have already seen that most studies of the effect of population growth on economic expansion indicate rising per capita income advantages over time associated with lower fertility, but on income distribution they contain only a few obiter dicta indicating improved income distribution under lower population growth.

More work has been done on the general relationship between income distribution by size and the stage of economic development.<sup>19</sup> These studies have been concerned both with changes in size distribution of income when per capita income levels are rising in a given country and with the cross

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19. The pioneering work in this field has been done by S. Kuznets. See especially his long article, "Substantive Aspects of the Economic Growth of Nations: VIII. Distribution of Income By Size," Economic Development and Cultural Change, January, 1963, pp. 1-80; and S. Kuznets, Modern Economic Growth, New Haven, Yale University Press, 1966, Chs. 4 and 7. For a good recent review of the work done in this area, see Felix Paukert, Income Distribution at Different Levels of Development: A Survey of Evidence, ILO, Geneva, 1973.

section analysis of countries, both developed and developing, with different per capita income levels. The main findings of some of these studies may be summarised as follows:

- i) If income distribution is measured by the share of income accruing to, say, the top 5-10 per cent and the bottom 20-40 per cent of households, there seems to be some evidence that income distribution widens in the early stages of development, followed by a period of relative stability and a narrowing of inequalities at a later stage. The greatest impact is felt in the share going to the top 5-10 per cent of the households;
- ii) The share of the top 5-10 per cent of the households tends to be higher in developing than in developed countries; on the other hand, the shares of the poorest 20 per cent of the population are slightly greater in developing than in developed countries;
- iii) Among the main variables identified in a recent comprehensive study of inter-country differences in income distribution among the developing countries are "the rate of improvement in human resources, the extent of direct government economic activity, the abundance of natural resources, the extent of political participation and the extent of socio-economic dualism."<sup>20</sup>

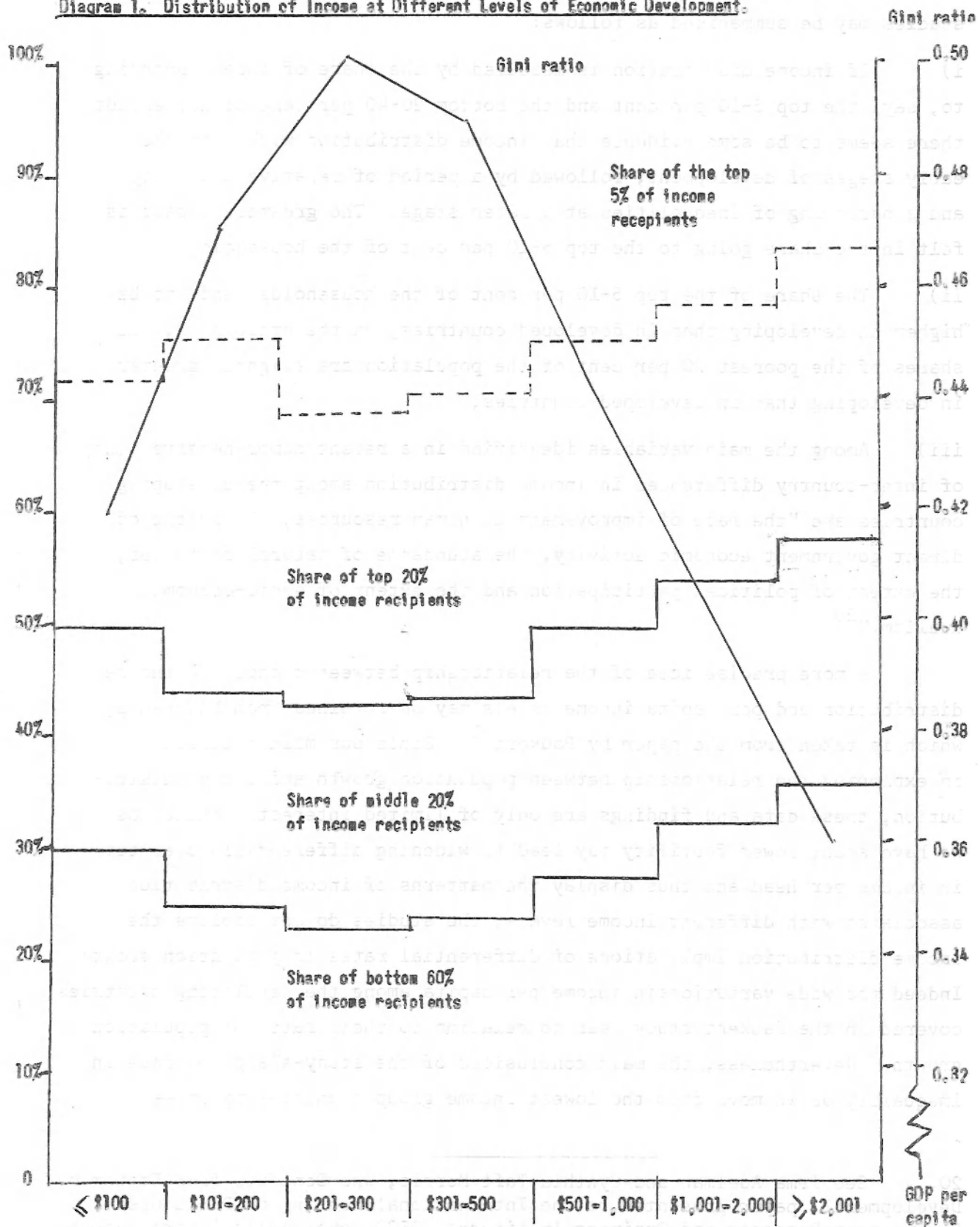
A more precise idea of the relationship between changes in income distribution and per capita income levels may be obtained from Diagram 1, which is taken from the paper by Paukert.<sup>21</sup> Since our main interest is in exploring the relationship between population growth and income distribution, these data and findings are only of limited interest. While, as we have seen, lower fertility may lead to widening differentials over time in income per head and thus display the patterns of income distribution associated with different income levels, the studies do not isolate the income distribution implications of differential rates of population growth. Indeed the wide variations in income per capita among the developing countries covered in the Paukert study bear no relation to their rates of population growth. Nevertheless, the main conclusions of the study-sharp increase in inequality as we move from the lowest income group countries to those

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20. See Irma Adelman and Cynthia Taft Morris, *Who Benefits from Economic Development?*, paper presented to the International Meeting of Directors of Development Research and Training Institutes, OECD Development Centre, Paris, 1972, p 46.

21. Paukert, *op. cit.*, p 28. The diagram is based on the Adelman-Morris data, corrected for several deficiencies and inconsistencies, and various other sources.

Diagram 1. Distribution of Income at Different Levels of Economic Development.



in the \$ 101-200 group, with the peak of inequality reached in the \$ 301-500 group, followed by a gradual narrowing of inequality beyond the \$ 500 level - is suggestive of the changes that might be associated with changes in per capita income caused by differential rates of population growth. However, for a number of reasons, including the new emphasis in many countries being placed on improved income distribution in the official policies and the greater political pressure from the poorer sections of the population, it seems highly unlikely that the past patterns of income distribution by level of economic development can be projected into the future.<sup>22</sup>

Turning now from the historical evidence to the analytical discussion of the factors connected with differential rates of population growth which shape the pattern of income distribution, the most useful starting point seems to be to focus on the relevant causes of inequality of incomes. The most important of them appear to be the aggregate ratio of natural resources, including land, and capital to the labour force, the distribution of these assets by households, changes in the structure of the economy, the inter and intra-sectoral differentials in productivity and changes over time, the nature of technical progress and the changing skill composition of the labour force. We shall examine briefly how each of these factors may be affected by differential rates of population growth.

Since a slower rate of population growth facilitates a higher rate of savings and capital accumulation, this should have a favourable impact on the relative returns to labour compared to capital. To the extent that relatively high returns from capital are an important cause of inequalities in size distribution of income, slower population increase should have a positive effect. The same arguments apply, but with even greater force, to natural resources, and especially land, whose supply can at best be increased very gradually up to a finite limit and at increasing cost. These arguments, however, need to be qualified by the effects of the participation rates noted above.

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22. In this connection, it should be noted that there are very few studies which explore the changes in income distribution within individual developing countries in the past decade or so. The few which have attempted to do so have come to very mixed conclusions. See Subramanian Swamy, "Structural Change and the Distribution of Income By Size: The Case of India," The Review of Income and Wealth, June, 1967; and Richard Weisskoff, "Income Distribution and Economic Growth in Puerto Rico, Argentina and Mexico," The Review of Income and Wealth, December, 1970.

These potentially favourable effects on income distribution of lower population growth may be more than offset by the changing distribution of assets, both reproducible and non-reproducible, by households. Is there any relationship between population growth and changes in asset distribution? Here there is no simple answer; everything depends on what we have called the pattern of development. If an increasing proportion of the higher capital accumulation facilitated by lower population growth is channelled into publicly-owned enterprises, this will reinforce the favourable income distribution impact of the aggregate relationships considered above. If, on the other hand, the process of economic growth proceeds along the capitalist path, such as was experienced by the present market developed countries, it seems inevitable that for long periods in the early stages of development there will be a tendency for an increasing concentration of ownership of productive assets.<sup>23</sup> It may be argued that this effect will operate perhaps even more strongly under conditions of rapidly growing population. But to the extent that faster economic growth is associated with a slower population growth, the process of increasing concentration of assets is also likely to be stronger.

The size distribution of income will also be affected by the differential rates of structural transformation associated with alternative rates of population growth. But the impact on income distribution is complicated, depending as it does on the initial distribution of labour force between agriculture and other sectors, the differences in sectoral per capita incomes and growth over time and intra-sectoral inequality of income distribution.<sup>24</sup> Under conditions typical of most African and Asian economies where the preponderant part of the labour force is in

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23. The reasons for this are too well known to need a detailed reiteration here. The process of development under the capitalist system is initiated by the emergence of entrepreneurs and progressive farmers who are able to take advantage of new technologies, markets and products. Their initial head start enables them to accumulate assets rapidly through increased incomes, preferential access to credit and to the whole range of benefits and incentives provided by the state to promote economic growth. The extensive role of foreign capital and entrepreneurs in developing countries is likely to reinforce this trend.

24. See S. Kuznets, "Economic Growth and Income Inequality," American Economic Review, March, 1955, for a thorough discussion of this issue.

agriculture, where there are considerable and possibly increasing differentials between rural and urban per capita incomes and intra-sectoral inequality either equal or possibly greater in the urban than in the rural sector, then the structural changes in the economy associated with a slower rate of population growth almost always lead to a widening of income inequalities in the sense of a rapid decline in the share of the bottom 20-40 per cent of the population and an increase or at best a slight decline in the share of the top 5-10 per cent of the households.

The overall capital-intensity and the nature of technical progress affect income distribution by their impact on labour absorption. A high degree of capital-intensity and labour-saving technical progress have adverse effects on labour absorption and hence on income distribution. We have argued earlier that more rapid capital accumulation under lower population growth is likely also to result in more "modern" techniques of production and consequently to widen inequalities by contributing to the growth of unemployment and underemployment.

Finally, the changing nature of the skill composition of the labour force has an important effect on income distribution.<sup>25</sup> A major source of income inequality in most countries is the skill differences in the labour force. In particular, in most African and a number of South American, Middle Eastern and South East Asian countries, high level skills command huge premiums. A slower rate of population growth, which enables higher per capita expenditure on training and education, should therefore have a more favourable effect on income distribution through a reduction in the relative scarcity of highly trained and skilled manpower.

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25. The Adelman - Morris study cited earlier identifies "the rate of improvement of human resources" as the most important variable in explaining variations in patterns of income distribution in developing countries.

The various strands of our discussion on the effect of differential population growth rates on income distribution by size can be conveniently summarised in the following table.

Table 5. Effect of Population Growth on Income Distribution.

| <u>Sources of Income Inequality</u> |   | <u>High Fertility</u> | <u>Reduced Fertility</u> |
|-------------------------------------|---|-----------------------|--------------------------|
| 1.                                  | Ratio of Labour to Reproducible Capital     | -                     | +                        |
| 2.                                  | Ratio of Labour to Non-Reproducible Capital | - <sup>i</sup>        | + <sup>i</sup>           |
| 3.                                  | Distribution of Assets                      | + <sup>i</sup>        | - <sup>i</sup>           |
| 4.                                  | Structural Changes                          | +                     | -                        |
| 5.                                  | Technical Change                            | +                     | -                        |
| 6.                                  | Skill Composition of Labour Force           | -                     | +                        |

Notes: <sup>1</sup> Likely under capitalist pattern of development.

Negative signs indicate worsening income distribution; positive signs the opposite.

As in our earlier discussion on employment, the final outcome will depend on the quantitative significance of these and other effects. It is certainly likely, as the historical studies show, that in the absence of active government policies in a wide range of fields, the faster economic growth associated with reduced fertility could widen income inequalities over long periods in the early stages of development under capitalism through the quantitatively powerful effects of structural changes and growing concentration of ownership of assets.

In conclusion, two qualifications should be made to the above analysis. In the first place, we have been largely concerned with the structure of income distribution, i.e. relative shares going to a given percentage of the upper and lower income groups of the population. It is likely, though by no means certain, that even if reduced fertility widens income inequalities, the absolute levels of income in all income groups may be higher than in a situation of high fertility.<sup>26</sup> Secondly, a more rapid growth of the total and per capita product under lower fertility does in principle open up better possibilities of redistribution of income through fiscal and other mechanisms.

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26. One of the conclusions of the Adelman - Morris study, op. cit., is that certain conditions in the early stages of the development process operate to worsen the relative and the absolute positions of the poorest 40% of the population.

## CONCLUSION

In this paper, we have attempted to consider systematically the impact of differential trends in fertility on net labour absorption and changes in the pattern of income distribution. Our method has been to trace the impact of the major consequences of different rates of population growth on the dependent variables. Although the paper is largely qualitative and conjectural, even so a number of important interactions and feedbacks have been left out of the analysis. Precise results can only be obtained through the use of quantitative models. But the relationships between different variables are so complex and our knowledge of them so scanty that it is inevitable that simplified models which attempt to quantify these relationships will yield partial and even misleading results.

A theme running through the paper is that reduced fertility can create the potential for greater net labour absorption and more favourable income distribution. But this potential can only be realised by the pursuit of appropriate development strategies to further these objectives. In their absence, it is not at all clear that reduced fertility will make a decisive difference to income distribution and labour absorption. Indeed, as most historical studies indicate, the problems of poverty and unemployment might be intensified over long periods of time as rapid growth associated with lower fertility proceeds from a low level of development.

However, the longer the time horizon, the more favourable are likely to be the effects of reduced fertility on labour absorption and income distribution. The longer the time considered, the more powerfully will the various consequences of reduced fertility operate in favour of employment expansion and improved income distribution. In addition, over really long periods stretching from 50 to 150 years, there are enormous social costs of increasing density, not to mention the staggering effects of a population growing exponentially at the current rates on pollution, exhaustion of non-reproducible resources, food supplies and ultimately the possibilities of economic growth itself.<sup>27</sup>

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27. For an exploration of these issues, see D.H. Meadows, D.L. Meadows, J. Randers and W.W. Behrens, The Limits To Growth, London, Earth Island Ltd., 1972.